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Combat Crew

strategic air command

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FEBRUARY 1978

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WE NEED A VICTORY...

Lt Col Richard W. Blatter
Editor

In 1977, SAC suffered a dramatic increase in the number of FOD incidents and the resulting damage cost. For example, we had 30 FOD incidents in 1976, but in 1977 we had almost 50. This represents an incident increase of more than 62%. The estimated dollar cost for 1976 incidents was $1.7 million, but in 1977 it rose to $2.6 million. The almost one million dollars in added damage cost represents an increase in excess of 65%.

Here are four examples of objects that have caused damage to our engines and the cost associated with each incident:

• Ingested screwdriver	$ 83,000
• Ingested headset & hat	$119,200
• Ingested flight cap	$ 10,000
• Ingested flashlight	$ 75,208

Additionally, rags were left in refueling booms in three instances last year; other foreign object mishaps resulted in flight control restriction, fuel contamination and tire damage.

In addition to the dollar loss that results from damage to our equipment, there is another factor to be considered in the form of lost training and the subsequent rescheduling of incomplete training tasks. Increased hours spent on the job are also costly in terms of morale, and could be avoided if FOD prevention is successful.

Precise reasons for the increase in FOD are not readily apparent, but personal involvement, or noninvolvement, has been a prominent factor. It is certain that FOD is preventable and all personnel share the responsibility to work toward its elimination. Another certainty is that as taxpayers, you and I contribute a portion of our tax dollars to pay for this preventable damage.

What does it take to have a successful FOD prevention program? An essential element is a well organized, detailed plan of action against FOD. We in SAC have a formal, easily understood FOD prevention program: Prevention of Foreign Object Damage to Aircraft, Missiles and Drones (AFR 66-33). With supplemented information, this comprehensive regulation outlines all the essential elements of Air Force, SAC and base FOD prevention requirements, procedures and concepts — it contains a great deal of detailed information. The regulation constitutes the formal program, but it is the people who participate in the FOD prevention effort that determine its success or failure.

In a successful FOD prevention program, it is absolutely essential to have a group of people who are dedicated, trained and committed to make the program work. Personal involvement on the part of maintenance, operations and support people is absolutely essential.

Publicity campaigns and effective training programs can add a great deal to the success of a FOD prevention effort. Capt Lynn Woolard, the HQ SAC FOD monitor has indicated that, "Those units with lower FOD rates not only educate and effectively train their people, they advertise, advertise, and advertise. This advertising emphasizes what can cause FOD; what ingested foreign objects can do to jet engines; what it can cost to repair a FOD'd engine; and how FOD can be prevented. The result of effective advertising is motivated people — people who feel the need to do whatever they can to avoid needless expenditure of their tax dollars."

Personnel in Capt Woolard's office, HQ SAC/LGMSP, are planning to produce an automated media (sound and slide) training program on FOD prevention. It should be in the field by this summer. The program will be used during initial training and recurring familiarization. You can assist in this project by furnishing good quality color slides or photos of FOD potential or actual foreign object damage, with descriptive narratives. Inputs should be sent to HQ SAC/LGMS (SAC FOD Monitor), Offutt AFB, NE 68113.

Aircrews are an integral part of the FOD prevention effort and they have a real opportunity to support it. Crewmembers should be constantly on the lookout for any item that could cause FOD. If ramp and taxiway deterioration is noted, it should be reported. If foreign objects are discovered on the ramp, they should be picked up. The nut, bolt, screwdriver or rock that is picked up and put into a pocket could conceivably reduce FOD cost by several thousand dollars. It could be the deciding factor in whether a mission is launched or aborted.

Another important factor is to make the application of the prevention program a continual effort. Continual involvement is required of maintenance, operations, support personnel, FOD monitors and wing FOD committee members. Constant attention is required to changing weather conditions, tool kit inventories, object accountability (safety wire fasteners, etc.), deteriorating ramp and runway surfaces and personnel fatigue factors. Repeated emphasis is required in all facets of the FOD effort to insure before-the-fact mishap prevention.

Even though we suffered a significant increase in the number of FOD incidents in 1977, we can quickly reverse the trend. We have a comprehensive, formal FOD prevention program. We have the dedicated hard-working people required to make the program a success and we certainly have a need for a victory in this area.

Combat Crew

Magazine of the Strategic Air Command - 28th Year of Publication

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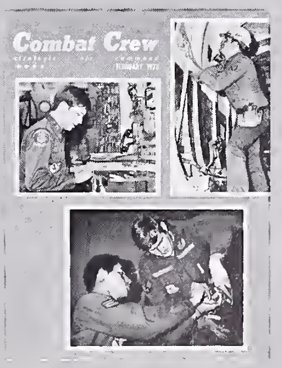

ON OUR COVER

Pictured are just a few of the outstanding personnel of the 90th SMW, F. E. Warren AFB. This "Hall of Fame" unit has completed another successful year in mishap prevention. For more of this story, see page 4.

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SAC's 90th SMW demonstrates . . .

SAFETY IN ACTION

A remarkable one million miles and more without a reportable mishap — that's some squadron record, but it's only a part of the story of SAC's 90th Strategic Missile Wing at F. E. Warren.

Last month, *Combat Crew* had the opportunity to visit this highly regarded "Hall of Fame" unit, and believe us, it was an eye-opening visit. The wing, we found, has earned three USAF Ground Safety Awards since 1971, one in 1974, another in 1975, and the most recent one in 1976. Warren was also awarded the USAF Nuclear Safety Plaque for 1976 and the Missile Safety Plaque for 1975 and 1976.

The USAF Chief of Staff Individual Safety Award is perhaps one of the most coveted individual awards in the Air Force, earned by an individual for his significant contributions to safety in such areas as inspections, education and training, the reduction and prevention of accidents and incidents, security, and the enforcement of safety practices. TSgt Ricardo N. Guerra, who was the Nuclear, Ground and Explosive Safety NCO for the 90th Security Police Group until he was reassigned, received the Individual Safety Award for 1975. His replacement, SSgt John P. Leibin, Jr., received the award for 1976.

In addition, the 90th SMW has received National Safety Council (NSC) awards for calendar years 1975 and 1976. In 1975, the wing received the NSC Award of Honor. The Award of Honor is the highest award given by the NSC. For 1976, the 90th received the Award of Merit which is the NSC's second highest award.

Approximately 4500 people are assigned to the 90th Wing; they are there to operate, maintain, secure and support the Minuteman III weapon system. Approximately 240 of these are crewmembers assigned to four missile squadrons.

Each month, the average line missile crew pulls eight, 24-hour alert tours and completes an additional 14 hours of training. Requirements include EWO training, weapon system instruction, and launch code handling training. Crews are evaluated at least annually by the Standardization Evaluation Division to determine their proficiency and mission readiness.

An interesting item in Warren's unique history is its four generations of medical care facilities. The fort's original facility, a wooden structure, was replaced by a brick building in 1887. That facility was boarded up and replaced by a third structure in 1909. The third hospital served Warren AFB until 1977 when the newest composite medical facility was opened. This new 40-bed facility

now houses all of Warren AFB's medical functions, including obstetrics/gynecology, surgery, and the dental lab.

Support personnel assigned to the 90th Combat Support Group (CSG) and to tenant units are housed in a variety of buildings, most of which were built in the early 1900's as barracks for cavalrymen. The stables directly behind each of the barracks enabled easy access to the horses for emergency patrols and dispatches. The stables are now offices and shops.

Det 10, 37 ARRS (MAC) makes a significant contribution to the safety and well-being of personnel at Warren and citizens who reside in Cheyenne and in the outlying areas.

Det 10, provides helicopter support to the 90th SMW. The detachment has 6 UH-1Fs and 11 pilots and provides security escort for each nuclear convoy that departs or arrives from the missile site complex. In addition, the detachment provides search and rescue capability to the local community.

The detachment is a Military Assistance to Safety and Traffic (MAST) unit. Through their DOD-

(Clockwise from far left) Col. James E. Cowan, Commander of the 90th SMW, updates the Safety Sunday count display. Participating in "Olympic Arena '77", SrA Lee Irick III, SSgt Wallace Harbin III, and A1C William Johnson install the gas generator in the re-entry vehicle aft section. Sgt Richard Nowak double checks the installation of the transporter erector to the pylons. Capt. Rick Hill, Training Division, tunes in the UHF radio in the launch control center to monitor airborne traffic. SSgt John T. Nation, 90th FMMS, conducts a pre-departure briefing at the DCM Safety Center. MAC personnel assigned to the 37th ARRS participate in a simulated rescue operation.

sponsored program, Det 10 provides search and rescue and medical evacuation to the civilian community, primarily within a 100-mile radius of F. E. Warren AFB. Since May 1975, when DOD designated the unit as a MAST unit, Det 10 has flown 50 MAST missions resulting in the saving of 111 lives. Notable in this period was the work done by the unit during the Big Thompson Flood in Colorado which resulted in the saving of 81 lives.

Another significant accomplishment was a mission in the Snowy Range mountains of Wyoming. A seriously injured University of Wyoming coed was rescued after a snowmobile mishap. The rescue mission was flown in particularly adverse conditions and received national recognition by being chosen as one of the five most outstanding MAST missions in the United States in 1976.

Thirty-nine of the 90th CSG people in the Services Division work at the Foil Pack Kitchen, the only one of its kind in the United States military. The Foil Pack Kitchen prepares, packages, and distributes meals wrapped in foil, much like commercial TV dinners. Each course is wrapped in a separate container or foil pack and includes such delights as fried chicken, roast beef, breaded pork chops, mashed sweet potatoes, hash browns, mixed vegetables, corn, peas, chocolate cake, apple, cherry or peach pie, just to name a few. Approximately 240,000 foil packs are prepared every six weeks for personnel assigned to the Wing's 20 launch control facilities, and for personnel at SAC's other Minuteman wings. One Titan wing also receives foil packs from Warren AFB every six weeks.

Many F. E. Warren enlisted per-

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USAF

45 Seconds . . .
Are we all safe?

Capt Roger L. Warnick
Capt Milten W. Price, Jr.
93rd AREFS, Castle AFB

It won't happen to me. Have you heard those words ramble through the back of your mind? Or maybe, "I hope it won't ever happen to me."

What are the odds in favor of looking out your cockpit window during a landing and seeing a herd of cattle in your path? A million to one?

The odds were closer to ten to one during an evening when 17 cattle made their way through a fence and wandered about in the vicinity of the runway.

There had been several aircraft landings that night. At 0317 a KC-135 made a low approach followed at 0324 by a B-52 low approach.

The noise is tremendous near a runway with B-52s and KC-135s making low approaches and touch-and-go landings. Cattle, however, do not always run when frightened, and, in this case, they huddled on the runway.

It was dark and no one had reported any cattle in the area. At 0330 hours a KC-135 was on final approach, intending to make a touch-and-go. The touchdown was normal but the "go" was not.

The mission, until then, had been relatively normal. There had been two refuelings and a nav leg. Eleven hours into their crew duty day, the student crew and instructor team began a penetration to home plate for multiple approaches and landings. John McKnight was in the left seat supervising Rick Sarver's approaches and landings. Stephan Brunner was in the "jump" seat, between and behind the pilots' seats. Hector Martinez was in the nav's seat behind the copilot's seat. Bernie Itzen was sitting on the sextant stand which is just aft of the nav table. Wayne Isacson was in the boom operator's seat at the left rear of the cockpit. Bill Coffin was strapped in a troop seat in the cargo compartment by the left wing. Now let's return to the action.

It took John and the other pilots an additional second to believe what their eyes were seeing . . .

Rick had just landed the aircraft 1500 feet down the runway. The throttles were placed at idle, and a correction made to centerline from the right side of the runway. John was resetting the flaps and trim for takeoff and glancing out the windows. Something caught John's eye out on the fringes of the landing lights. His first thought: discoloration of the runway. Rick moved the throttles forward for takeoff. John's second thought: a flock of birds. These two impressions were fairly automatic. Crewmembers are used to seeing variations in color on runways, and they are constantly on the alert for birds. That's probably why it took John and the other pilots an additional second to believe what their eyes were seeing — a herd of cattle right on centerline! The pilots immediately realized "it" was going to happen to them. Two seconds later it did! Start your stop watch and I'll lead you through the next 45 seconds of the lives of these seven young men.

0 Seconds — Impact. Stephen was already on the radio to tower, "We've just hit some cows; send the fire trucks!" Two louds thuds were heard. The speed was 130 knots.

2 Seconds — Bill was on interphone only and did not hear Steve's call to tower. Bill's immediate thought was that they had just blown some tires. He got out of his seat to check.

3 Seconds — The nose of the airplane settled to the runway. The nose gear had been violently forced back against the belly of the aircraft rupturing the forward body tank. Ten thousand pounds of JP-4 began spilling on the runway. It ignited. The throttles were immediately pulled to idle. Everyone heard Steve's call to tower except Bill. Everyone heard the noise as the nose gear and left main gear slammed into the stunned cattle. Everyone heard John over interphone, "We are going to crash." Those were chilling words spoken calmly and with authority. "It" was happening to them at 130 knots.

Everyone heard over the interphone, "We're going to crash . . ." It was happening to them!

5 Seconds — Things became very busy. The left wing settled to the runway. In this attitude the plane headed left so John applied right rudder and called for assistance from Rick; he was already on the rudder. The airplane responded. Full right rudder had enough effect to keep the plane on the runway, at least at 125 knots.

Hector and Wayne could not help at this point. They could only watch, keep their senses alert and wait, and wait. Bernie went into action. He went behind the nav's seat and surveyed the situation. He announced loud enough for everyone to hear without benefit of interphone, "Everyone put on your gloves!" He realized that there would probably be fire and gloves might provide important protection. Bill looked out the left overwing hatch. He did not see blown tires, but he did see flames engulfing the left wing.

6 Seconds — Bill looked out the right overwing hatch and observed flames coming from under the airplane right under where he was standing. As he moved toward the cockpit, he glanced to the rear of the cargo compartment. Flames were already inside the airplane!

Bernie began to take the escape ropes from their containers in the ceiling of the cockpit.

7 Seconds — With the two left engine pods scraping the runway and with the airspeed below 100 knots, the rudder became less effective. Rick applied pressure to the right brakes. The effect was minimal but it was enough to keep the airplane on the runway for a couple of more seconds. Bernie draped one escape rope over a hook above the crew entry chute, another he held ready to hand to John. Steve was ready to hand Rick the third escape rope.

He could see the ground about six feet below . . . He jumped to the ground and ran . . .

John did not see what was going on behind him because his eyes were glued to the front. There was plenty of action up front, but John had the presence of mind at that point to order that the escape ropes be readied for possible use.

8 Seconds — Bernie saw Bill approaching the cockpit and noticed the flames in the rear of the airplane. He knew that possible escape paths were rapidly narrowing.

9 Seconds — Bill reached the cockpit and, as he braced himself, he yelled to the rest of the crew that fire was in the cargo compartment and that escape was not possible to the rear. It was official. Everyone knew that the only sure escape was through the pilots' windows. One possible escape had been through the crew entry chute but that wasn't likely now with the nose of the airplane on the ground. Everyone began to plan their escape as the aircraft slid along the runway.

10 Seconds — The aircraft was slowing. All attempts to keep it on

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BIG INSTRUMENT

CONSTANT BANK ANGLE ARCS

Capt. Lewis M. Hatch
1st Combat Evaluation Group
Barksdale AFB

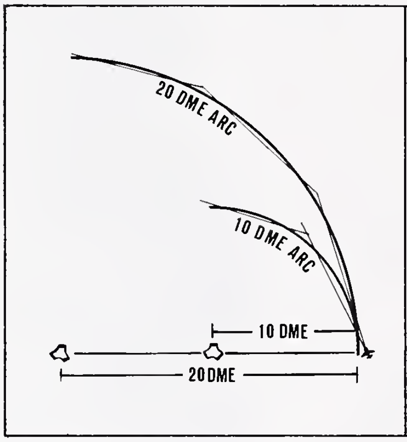

Fig. 1

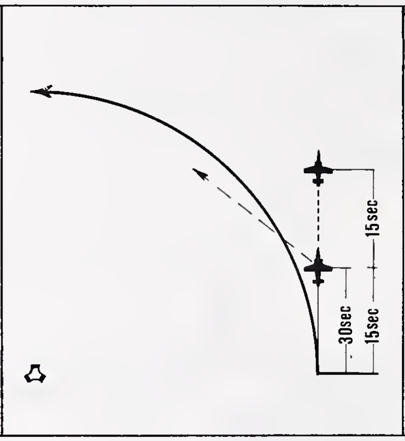

Fig. 2

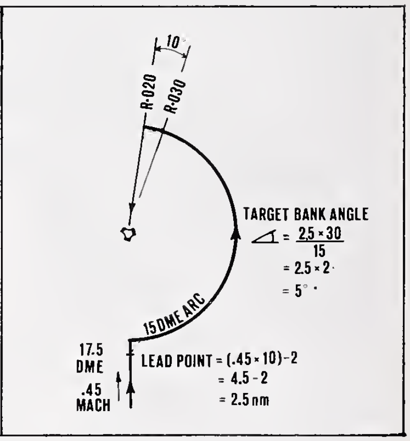

Fig. 3

The DME arc is a familiar maneuver to the pilots of TACAN or VOR/DME equipped aircraft. The arc commonly occurs in published departures, penetrations, and approaches or may be contained in an ATC clearance ("Cleared via the 30-mile arc east of Slippery Rock TACAN to . . ."). AFM 51-37 currently describes two procedures for flying an arc. One method, often referred to as segmenting the circle, involves flying a series of short straight legs approximating the arc. The other method is known as the constant bank angle arc and involves flying a bank angle that will cause the aircraft to track along the arc. The word "constant" here is a misnomer in that the bank angle will usually have to be varied slightly to maintain the arc under real world conditions. Although the segment method is more widely used by pilots, under certain conditions the constant bank angle method is more practical. The big question is when is a constant bank angle arc practical and how is it flown?

WHEN IS IT PRACTICAL?

Many of you have already been exposed to the situation where you are flying into Roger-Datt AFB for an immediate TACAN penetration, which features a 10-mile arc. As you roll out on the arc doing approximately the speed of heat, you notice that the silly little blue line on your approach plate is breaking away from you faster than an F-15 in a high "g" turn. For the rest of the arc you are wildly attempting to segment the circle and get back in the same state with the 10-mile arc. Each time you start to roll out the bank for a straight leg, it's time to roll back in and intercept the arc again. You wind up so far behind the airplane that you grossly overshoot the radial you were looking for. You've just executed the John P. Goldenhands, super modified, segment the constant bank angle arc (whatever that is), followed by a Whitey Nukkles missed approach maneuver. If it sounds to you like a constant bank angle arc would have been a more practical solution to the problem, you get a gold star. The factors making the segment the circle method impractical in this situation are the relatively small size of the arc and the high speed of the aircraft.

The importance of the size of the arc is shown in Figure 1. The smaller the arc, the greater the curvature and the faster the arc will diverge from a straight line course. This means that straight leg corrections to the arc must be made more often, will require greater heading changes, and will be shorter in length. The result: you will be constantly rolling into and out of turns with relatively short periods of level flight. A moment of inattention will result in being significantly displaced from the desired arc.

The effect of aircraft speed is shown in Figure 2. On a given arc, faster aircraft must make corrections more often or accept a larger deviation from the arc than a slower aircraft. As an example, an aircraft flying twice as fast as another aircraft will have half the time interval between alters to remain within the same distance of the arc.

The bank angle required to maintain an arc will be based upon the speed of the aircraft and the size of the arc. The aircraft speed determines the turn radius for any given bank angle and the size of the arc determines the radius required. Combining these factors in a rule of the thumb, we can arrive at the required bank angle in degrees. To use this rule of thumb, first derive the turn radius for a 30-degree bank turn (TR). For our purposes, we may arrive at this figure one of two ways:

1) TR = TAS (in nautical miles per minute) minus two, or

$$TR = \frac{nm}{min} - 2$$

2) TR = Mach Number times ten, minus two, or TR – (Mach x 10) –2

Once the turn radius is determined, the required bank angle to maintain an arc may be found as follows:

Bank angle (∠) equals turn radius times 30, divided by the arc, or

$$\angle = \frac{TR \times 30}{arc}$$

Now, let's work a sample problem. We are going to fly a 15 mile arc at .45 Mach. Our formula becomes:

$$\angle = \frac{TR \times 30}{arc}$$

$$TR = (.45 \times 10) - 2 = 4.5 - 2 = 2.5$$

$$\angle = \frac{2.5 \times 30}{arc} = 2.5 \times 2 = 5°$$

A five degree bank angle should keep you on or near the arc. If you come up with less than three degrees of bank, segmenting the circle may be more practical. At the speeds most turbojets use for penetration, constant bank angle arcs may be advantageous for arcs of 20 miles or less. Now that we've determined that our arc will require a bank angle of five degrees, how do we fly it?

FLYING THE ARC

The best way for us to discuss the techniques involved in flying the constant bank angle arc is to follow an example through the entire maneuver. For our example, we'll use the same numbers we used in the previous paragraph. We will be intercepting the 15-mile arc from a radial, arc at .45 Mach and depart the arc by intercepting a radial. Figure 3 depicts our sample arc.

Our first step is to compute a lead point for the turn onto the arc. We intend to use 30 degrees of bank and the turn is approximately 90 degrees. We will lead the turn onto the arc by the 30-degree bank turn radius (TR). So our lead is:

$$TR = (Mach \times 10) - 2$$
$$- (.45 \times 10) - 2$$
$$= 2.5 \text{ nm}$$

We will initiate our turn onto the arc at 17.5 DME. Since we've decided to use a constant bank angle arc, we take the computed turn radius and arrive at a target bank angle:

$$\angle = \frac{TR \times 30}{arc}$$

$$= \frac{2.5 \times 30}{15}$$

$$= 5°$$

We now have all the required numbers to fly the arc.

Under ideal conditions, we hope to roll out of our

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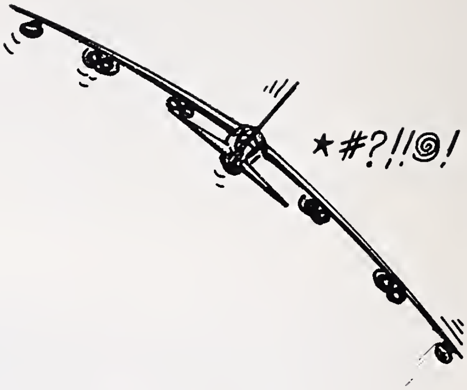


If you fly safe . . .

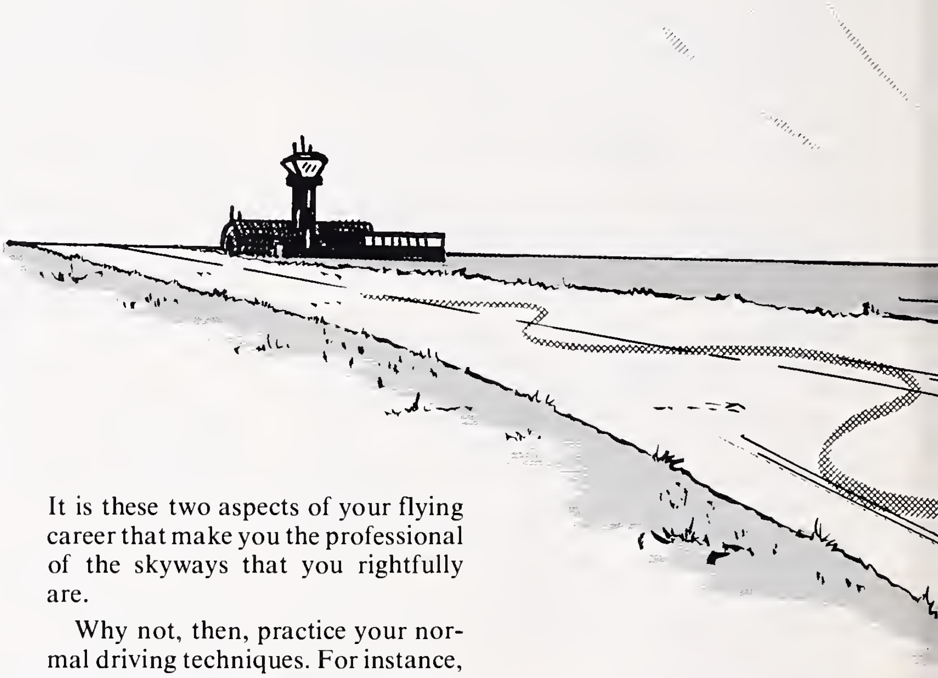
Why Not Drive Safe

Capt Craig L. Bivins

If I asked you how many hours of flight time you had, I'll bet that you could tell me without hesitation. Most crewmembers could. But let me ask you another question: How many hours of auto driving do you have?

You mean you don't know. That's not unexpected. I don't even know myself how many **ground** hours I've accumulated, but I can make a fair guess. If you consider the average crewmember, he has six years in the service, is 27 years old and has maybe 1500 hours of flying time. This same fellow has been **driving** for approximately 10 years and probably averages 30 minutes behind the wheel of his car each day. So, at a conservative estimate, he has driven his car about 1750 hours. Now, the car is a simple machine, and the road rules are not too difficult. So, considering his experience at driving, you naturally assume he is as good or better a car driver as he is a pilot or navigator.

Wrong assumption. Just ask any insurance company what the odds are and you will be swarmed in tons of figures. It is far more safe for you to fly from your home to Europe and back than it is for you to spend an hour driving around your neighborhood. The reason I think stems from two things: practice and preparation.



It is these two aspects of your flying career that make you the professional of the skyways that you rightfully are.

Why not, then, practice your normal driving techniques. For instance, take two plastic garbage cans and set them up in your street about six feet from the curb and about two car lengths apart. Park between them. Reduce the distance between them and try parking again. Just how little space do you need to parallel park in one effort, with no jockeying back and forth?

Or, consider setting up a rally course to test your skill in maneuvering. It can be fun.

Something else that was fun was also quite illuminating for me and my wife last winter. There had been an ice storm during the week that covered everything with a thick coating of wet ice. My wife is from Hawaii and had never driven on snow or ice. So I found a large supermarket parking lot that was vacated one Sunday morning. After assuring myself there was nothing to run into, I gingerly started a series of skids and recoveries. When I had assured myself I could handle any kind of a skid I could get myself into, I gave my wife a turn. She started off slightly scared, but by the time she finished I practically had to drag her away. She ended with an increased driving confidence and ability, and I had the knowledge that if she inadvertently skidded or slid the car on the highway, she wouldn't panic and do the wrong thing.

What she learned was that if you go into a skid, don't panic, and don't brake. Take your foot off the accelerator and steer in the direction the rear of the car is sliding. But, don't oversteer. When you feel the car straightening out, turn the wheels straight and keep rolling. With practice, it is easier done than said.

As for preparation, this includes keeping both yourself and your car prepared for driving. When are you prepared for driving? When you are healthy, alert and sober. If you are sick, avoid long trips. Your endurance and reaction time are seriously affected. Also, the use of certain medicines will slow down your reaction time just as much when you drive, as when you fly. Read the directions that come with the medicines. Some of them specifically forbid driving when used. Be sure and get enough sleep so you can stay alert. You would not think about staying out all night and flying. Well, driving is different only in degree. Stay sober. You have had that pounded into you so much that I'm not going to lecture you. You know you shouldn't drink and drive, and if you do, you are the world's biggest fool.

Don't forget your car needs preparation too. It needs preventive maintenance and should be checked periodically for hazards. Give your car a complete check up and repair what you find wrong. Don't wait for that breakdown at 4:30 p.m. on the freeway. Keep some tread on your tires and figure out a rotation schedule for them. Check your brakes and hydraulic fluid lines. Check out everything, it shouldn't take that much time. You probably spend more time preflighting your equipment before one flight than you do on your car in an entire month.

Learn from your training and apply standard flying precautions to driving. Practice and stay prepared. If you do, you can beat the odds the insurance companies give the average motorist. Believe me, those aren't odds with which you want to be stuck in 1978 or any other year.

B-52 PHYSIOLOGICAL IN

Lt Col Carroll R. Cooley
Chief, Physiological Training & Support Branch
Office of the Surgeon
Offutt AFB

Between January 1976 and October 1977, SAC B-52 aircraft experienced nine cabin pressurization system failures resulting in reportable physiological incidents. A total of 21 crewmembers were affected in various degrees of severity ranging from mild discomfort to incapacitating bends pain. A surprising 43 percent of the aircrews experienced hypoxia, and a significant 33 percent were affected by trapped gas problems in the middle ear or gastrointestinal tract. A breakdown of the incidents is as follows:

Hypoxia — 9 crewmembers
Trapped gas problems — 7 crewmembers
Hyperventilation — 3 crewmembers
Evolved gas problems — 2 crewmembers

- Of the nine hypoxia incidents, five were reported on the same flight and the cause was determined to be oxygen contamination; three aircrews were victims of faulty oxygen regulation on two other flights; and the remaining hypoxia incident occurred at a cabin altitude of 22,000 feet. In this case the copilot was slow in donning his mask and had to be told to do so several times by the aircraft commander.

- The seven trapped gas problems were probably of a less serious nature, but nevertheless did cause discomfort and distraction from the task at hand. Two ear blocks were experienced in flight, and one delayed ear block was reported four hours after mission termination. Four crewmembers experienced mild abdominal gas expansion pain and cold discomfort following a rapid decompression at 35,000 feet.

- Three crewmembers hyperventilated and all three recognized their symptoms (tingling sensation in extremities, lightheadedness). They took the proper corrective action and relieved the symptoms.

IDENTS

- Evolved gas decompression sickness affected two other crewmembers. In one case the cabin pressure fluctuated from 17,000 feet to minus 500 feet to 20,000 feet in less than 15 seconds. The pilot experienced a sharp pain in his elbow and, recognizing this as bends, immobilized his arm and descended immediately. The pain subsided at 10,000 feet. In the other case a crewmember complained of sharp pain in the knees, elbows, and shoulders after approximately three hours of unpressurized flight at 23,000-25,000 feet. The pilot immediately descended and the pain was relieved at 16,000 feet and completely subsided at ground level.

In analyzing the 711gA data, it is painfully evident that loss of cabin pressurization is not uncommon in our aging B-52 fleet. Our aircrews are aware of this and often have alternate missions planned that can be flown at lower altitudes. But the data does point out that loss of pressurization can and does occur suddenly at high altitude. This always requires immediate use of *functioning* oxygen equipment. ("A PRICE CHECK on faulty oxygen equipment is seldom completed at a cabin altitude of 35,000 feet." — Cooley's Law)

The data also points out that trapped gas expansion problems and evolved gas decompression sickness problems are constant hazards at high cabin altitudes. Our aircrews must be aware of these hazards. They must be able to recognize them and take immediate corrective action. Flying at a cabin altitude of 25,000 feet is perfectly acceptable and within the intent of AFR 60-16. However, if prolonged flight at this limit is absolutely necessary, crews must be constantly alert for any symptoms of decompression sickness. They must be able to recognize these symptoms and know what to do about them. Our job in physiological training is to make sure they do just that.

INSTRUCTIONAL TELEVISION • SOUND/SLIDE • PUBLICATIONS

TRAINING TOPICS

... A SYNOPSIS OF NEW PROGRAMS FOR SAC AIRCREW TRAINING

We have discovered from our visits to the units in the field, that Wing Instructional Systems Managers (WISM) are doing an excellent job of monitoring and assisting in your academic training. Now that many of you are intimately involved in building lesson plans and instructing, you are aware of the problems one faces in providing quality instruction. Since the WISM reviews and critiques our products as well as yours, provide him with any comments or suggestions you might have concerning current programs or the need for additional programs. Also, do you have a need for a particular training device to enhance proficiency training? Let us know so we can help.

Here are the recent videotapes from the television studio. (NOTE: Programs are unclassified unless otherwise indicated.)

- "B-52G Flight Controls, Part I" (Program #1311) — reviews normal operation of the primary flight controls: the rudder/elevator system, spoiler/airbrake system, and the flaps.
- "B-52G Fuel, Part I" (Program #1310) — reviews the basic fuel system, normal checks, fuel management, and fuel system limitation.
- "B-52G Engines, Part I" (Program #1313) — reviews the engine system and its operation, the Form 781, preflight requirements, and the engine start procedures.
- "B-52G Engines, Part II" (Program #1314) — reviews takeoff procedures, both wet and dry, engine operation during cruise, limitations, and engine shutdown at the end of a flight.
- "B-52G Hydraulics, Part I" (Program #1316) — reviews the normal operating procedures of the system.
- "B-52G Hydraulics, Part III" (Program #1312) — reviews the Rudder/Elevator Hydraulic System and the yaw and pitch Stability Augmentation System (SAS).
- "EVS, Part II: STV and FLIR Tuning" (Program #1352) — this CONFIDENTIAL program discusses: (1) procedures and techniques for initial tuning and retuning the EVS monitor while in STV; (2) procedures and techniques for tuning and retuning FLIR; and (3) procedural steps for manually tuning STV with failure of the Automatic Light Control (ALC) sensing circuits.
- "SAC Hangar Flying #4, The Critical Eleven Minutes" (Program #018) — discusses the periods of flight referred to as the "critical eleven minutes." These are defined as takeoff plus three minutes and landing minus eight minutes. The cockpit indications that cause accidents during these critical eleven minutes is the main topic of discussion.
- "SAC Hangar Flying #6, Low Visibility Landings" (Programs #020) — discusses the hazards encountered in landing from a low visibility instrument approach. These hazards are illustrated in some excellent visual sequences. Common pilot errors are discussed and suggestions made for landing in low visibility conditions.
- "MSG-2" (Program #5001) — explains how SAC's new maintenance inspection program was adapted for the B-52 and KC-135 from the commercial airline industry. The program is designed for maintenance personnel but should be of interest to operations personnel.
- "KC-135 Celestial Navigation, Part I" (Program #1713) — discusses four items to consider when planning a celestial navigation mission. It further explains six tasks the navigator can do after formal mission planning to better prepare himself for the celestial portion of the flight.
- "AN/ASQ-48 Bombing Navigation System, Part III: Bombing Crew Coordination" (Program #1409) — demonstrates sound RN/Nav bombing crew coordination on a sync-sync run. The program is divided into two parts: one is a step study of the bomb run from the TIP through the second target explaining exactly what the crew is doing on the

run; part two re-runs the bomb run in real time without any breaks. We recommend that pilots view the tape at least once.

- "Escape System Briefing" (Program #722) — a Hq USAF/IG briefing on the subject of egress from aircraft inflight and the rate of successful versus unsuccessful ejection. The discussion considers the reasons for unsuccessful ejections and analyzes these reasons.

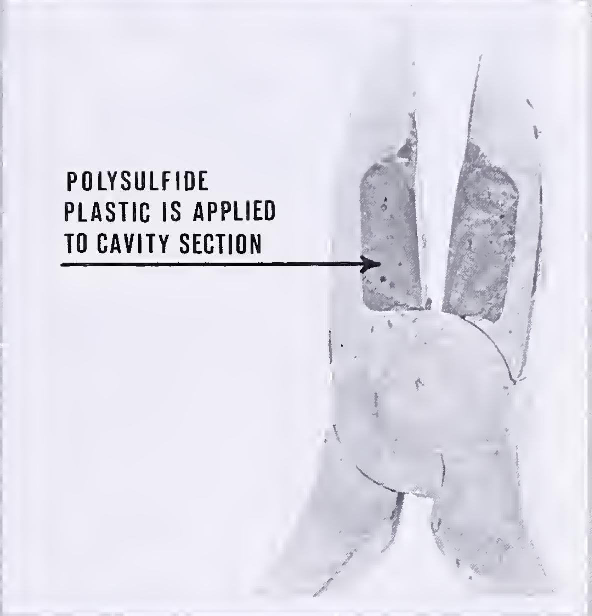
Our tape/slide branch continues to support the ISD offices at the three CCTSs; however, they recently produced a program for wing and squadron safety personnel entitled "The 581 Story" (Program #903). It describes in detail how to fill out each section of the SAC Form 581, Safety Inspection Report. Material is presented in a story format and includes a self-quiz with examples of a completed SAC Form 581.

There has been a delay in the production of the EWP 1-1, Electronic Warfare Principles, Parts II, III, IV, and V. As soon as these tape/slide programs are completed, they will be distributed to the field and mentioned in this article.

There are numerous B-52D/G and KC-135 systems programs currently in production that should be in the field soon. Additionally, we have a KC-135 orbit/rendezvous series coming, a show on meaconing, an extensive series on KC-135 cargo loading, and an instrument refresher course.

The SAC Directorate of Safety will conduct the annual SAC Safety Management Seminar at Carswell AFB the week of 20-24 March 1978. The seminar is for selected safety personnel from throughout the command and representatives from air staff agencies to update them on the latest accident prevention program methodology.

Remember, our phone numbers are in our catalog which the WISM has, so if we can be of assistance to you or you have some ideas, call us. We're here to provide training support for you!

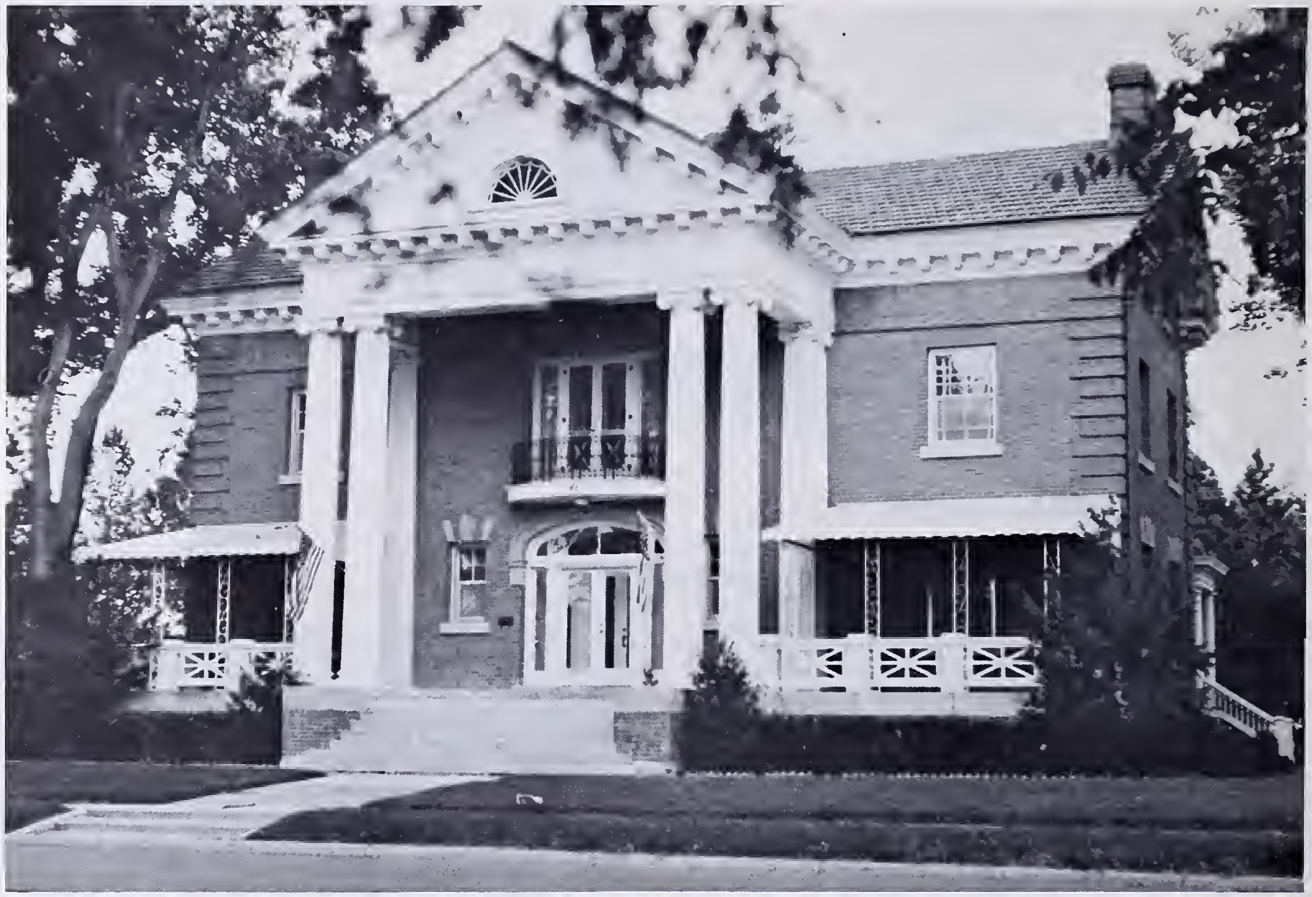


SAFE FOD PREVENTIVE FOR SAFETY WIRING

Sacramento Air Logistics Center maintenance personnel have developed a safe procedure for clipping the ends off safety wire after the wire has been twisted. Wire twisters, a standard tool in aircraft maintenance shops, are normally available with plastic inserts to keep the wire ends from flying and becoming a safety hazard or a potential foreign object. Engineers and laboratory technicians have devised a method to bond a plastic material to the cavity section of the cutter/twister.

The method has far reaching application, even to replacing the plastic insert on other types of cutters. First, clean the cutter cavity thoroughly with a nylon brush and a solvent containing methyl ethyl ketone (MEK) or methyl isobutyl ketone — complying with published warning concerning uses. Second, inspect surfaces to insure that no corrosion is present. Third, divide the cutting cavity by placing foil (less than .002 inch thickness) in line with the cutting edge. Treat foil surface with a release agent. Then lock the cutting jaws firmly and fill the cavity with a high strength polysulfide material (we used Product Research Type 380M). Finally, keep cutter jaws locked while the polysulfide cures at room temperature for approximately24 hours.

Sacramento personnel have successfully placed an insert in all cutter/twisters. You can too. For further information on the technique, contact Mr. John Rotter, SM-ALC Industrial Engineer, at AUTOVON 633-2892.



Quarters 92, the General's Quarters, was built in 1910. There are only two other structures like it in the military, one at Fort Totten, New York, and the other at Fort Monroe, Virginia.

Safety In Action

continued from page 7

sonnel dine at Chadwell Hall, formerly a stable built in 1908. Decorated in motif of the Old West, Chadwell Hall was nominated for the Hennessey Trophy last year. The dining facility placed first in SAC and second Air Force wide.

Communications play a vital role in the effectiveness of the mission. The filtering agency and the hub of all communications affecting mission accomplishment is the wing command post. It is the focal point for all disaster control, increased readiness and alert force status.

F. E. Warren AFB claims uniqueness in that its command post deals exclusively with missile related activities since the base has no runway.

Uniqueness is a feeling that abounds at Warren AFB. You don't have to look very far to be reminded by a massive brick building or a stone plaque or by the old cemetery that there exists today a heritage from Fort Russell, the heritage of defending our freedom and growth. According to Col James E. Cowan, commander of the 90th SMW, "Our equipment is relatively the same as that assigned to the other Minuteman wings. What is unique is the personnel assigned to the wing. Our young men and women are the finest group of professionals I have had the pleasure of working with to date. They are personally involved with the mission and can be counted upon to do their best to guarantee its success."

At F. E. Warren, the hardware has evolved from sabres, muskets and men mounted on horseback, defending railroad workers, settlers and others who dared the unknown West, to the most modern technology of ICBMs maintained by a dedicated team of men and women defending the lifestyle that has been earned for us by past generations. The men and women of the 90th SMW share with cavalrymen of the early days a heritage as sentinels of the nation.

In those early days, men had arrived with the Union Pacific to build a railroad through Wyoming and across to the Pacific. They were in constant danger of being attacked by Indians, who did not want an invasion on their hunting grounds. Consequently the President sent the cavalry and established Fort Russell, so the workers' safety would be guaranteed and they could concentrate on the work at hand.

Fort David A. Russell now known as F. E. Warren AFB, was established in 1867. The railroad was completed and became an artery in the life flow and growth of our nation, and the fort and its sister city, Cheyenne, survived and grew. During the next 80 years, the fort served as an army supply point and a cavalry

Hill Manor VOQ was built in 1910. This building was once known as the Artillery Club. It is now Visiting Officers Quarters.

This infantry barracks for 76 men cost $15,680 in 1885. It is one of the 107 year old base's oldest structures. The barracks red brick exterior remains as it was built, but the interior houses a modern base exchange main store.

All functions of the transporter erector in emplacing or removing a missile from the launch facility are controlled from an exterior control panel. Sgt Donald Nedza hooks up the control panel to the rear carriage of the transporter erector.

post. In 1930, the fort was renamed for Wyoming's last territorial governor, first state governor and longtime senator, Francis E. Warren. In 1947, the Army relinquished Fort Warren to the newly formed U. S. Air Force, and it became Francis E. Warren AFB.

In 1958, the Strategic Air Command assumed control of the base and began construction of the nation's first Atlas ICBM wing. On 1 July 1963, the 90th SMW was activated, followed shortly by a phaseout of the Atlas and phase-in of the Minuteman missiles. One year later the 90th began its current superior record of missile mishap prevention. That success in missile safety has been reflected for many years in the "Hall of Fame" feature in *Combat Crew*.

F. E. Warren became the largest missile wing, and later in January 1973, it became the most modern Minuteman III wing in the nation with the completion of the Command Data Buffer modification.

In spite of the modernization and progress there is still an atmosphere of the past at Warren. History flourishes here, constantly reminding people of the long and enduring 111 years of activity.

Designated a National Historic Landmark in 1975, most of the buildings at Warren still reflect in their original architecture and design.

The brick structures still standing at the west end of the base were part of the first expansion of Fort Russell starting in 1885, and are the oldest structures on base. The Main Exchange and the building that houses the Base Library and Education Office were originally barracks built to replace older wooden structures. The Base Museum was built in 1894 as the post headquarters. The original jail house is now the Base Credit Union. The single family brick homes replaced the rough board homes of 1867 and presently house company grade officers and their families. Some of the wooden homes were moved to Cheyenne and are still in use today.

A second expansion of brick homes and buildings took place from 1902 through 1930. Still remaining from that expansion is Quarters 92, the General's Quarters. There are only three structures like it in the military, one at Fort Totten, New York and the other in Fort Monroe, Virginia.

The base has a large number of brick horse stables built around 1902. They have been internally converted to serve as offices and shops to support the wing's mission.

The Maintenance Safety Center, part of the 90th OMMS is located in one of the old stables. OMMS personnel are responsible for maintaining the wing's missiles and their related equipment. The center provides multimedia, audiovisual safety awareness and motivational briefings to all dispatching maintenance teams prior to each departure. According to Col William J. Heske, Deputy Commander for Maintenance, "This emphasis on safety has enabled our people to achieve our remarkable ground safety record. OMMS personnel have traveled more than 650,000 miles to complete 3200 maintenance dispatches without a reportable injury in a government motor vehicle mishap."

Wyoming driving is unique and harrowing to many who have never encountered the phenomenon of "black ice" and cross winds strong enough to force semi trailer rigs onto road shoulders and into the medians of interstate highways. Black ice occurs when cool, moisture laden air comes in contact with paved surfaces and forms a clear ice glaze that is not readily apparent to the unsuspecting driver. Cross winds are common in most areas; but their severity is unusual in the 90th area of operation.

OMMS's sister squadron, the 90th Field Missile Maintenance Squadron, responsible for maintaining the launch control facilities, the launch facilities, and their related equipment, has exceeded one million miles of driving without a reportable mishap.

The wing is assigned 200 Minuteman III/Command Data Buffer missiles located in a tri-state area surrounding Cheyenne. The missile sites spread 80 miles north in Wyoming, 150 miles east in Nebraska, and 135 miles south in Colorado, to cover 12,000 square miles of territory. Maintenance teams and combat crewmembers travel an average of six million miles per year.

Because of Wyoming's expansive terrain, and the vast number of miles that wing personnel drive in support of the mission and for recreation, the Safety Division launched a program to increase awareness of vehicle safety. In 1971, the wing initiated a "Safety Sunday" program by which the wing commander could designate a Monday down-day for everyone who contributed to a wing record of 20 consecutive days without a reportable motor vehicle mishap, government or private. This program has provided considerable incentive for mishap prevention within the wing. "The AF Ground Safety Awards that we've received since the Safety Sunday program began indicates a definite increase in safety awareness among all vehicle users," commented Maj Richard V. Modic, chief of the Safety Division. This recent innovation is typical of F. E. Warren's continuing emphasis on safety. The 90th is the number one Minuteman unit on SAC's Hall of Fame, and after our visit with the dedicated people there, we think we know the reason why.

Preparing for a routine patrol, SrA Richard Lunn (left) and SrA Robert Long load their M-16s in a clearing barrel outside the launch control facility. The barrel, a 50-gallon drum loaded with sand to cushion a bullet should the gun discharge, is also used as a safety measure for unloading a weapon before the team enters the LCF.

NAVAID PMI'S

You're nearing the end of another successful training sortie and are approaching the IAF for your home base. The weather is good and now is the time to do that final review of that TACAN approach procedure.

"Canyon Approach Control Hep 21 request HI-TACAN penetration with one turn in holding at Sugar DME fix."

"Hep 21 Canyon Approach unable HI-TACAN. TACAN is down for NO-NOTAM PMIs. Request your intentions?"

This ever happen to you?

NO-NOTAM Preventive Maintenance Inspections provide for periodic inspections and adjustments of NAVAIDs and terminal radar equipment. These inspections are performed to assure the integrity of the monitor systems and the realiability of equipment.

The FLIP IFR Enroute Supplement outlines the standard times and the days of the week that this maintenance will be performed. Deviations are authorized and these can be found under Radio/NAV remarks for the aerodrome in question. The majority of SAC bases have published deviations.

NO – NOTAM PREVENTIVE MAINTENANCE PROCEDURES

NOTAM action is not required when performing routine preventive maintenance with USAF/USN facilities indicated below. Equipment will be immediately returned to operation or NOTAM action taken if weather conditions deteriorate below ceiling or visibility requirements listed. Also, NOTAM action will be taken if equipment cannot be returned to operation within the specified time period.

Radio/Radar Facilities and Services	Specified Time Periods ①		Required Weather Conditions (Existing plus one hour forecast)			
			U.S. NAVY		U.S. AIR FORCE	
	Days	Time (Local)	Ceil	Vis	Ceil	Vis
ASR	Sat–Sun	0800–1000	5000	5	3000	5
	Mon thru Fri	0200–0400	5000	5	3000	5
PAR	Sat–Sun	1000–1200	3000	3	3000	5
	Mon thru Fri	0400–0600	3000	3	3000	5
TACAN	Sat–Sun	1500–1600	Clear to 4/10ths	10	3000	5
VOR	Sat–Sun	1400–1500	Clear to 4/10ths	10	3000	5
LF/MF (NDB-Range)	Sat–Sun	1700–1800	Clear to 4/10ths	10	3000	5
ILS	Sat–Sun	1600–1700	3000	3	3000	5
UHF/NDB	Any Day	0800–1000	Clear to 4/10ths	5	3000	5

① Deviations to this schedule are approved. Submit deviations to this schedule via appropriate FLIP Correction addressee for inclusion under RADIO/NAV REMARKS.

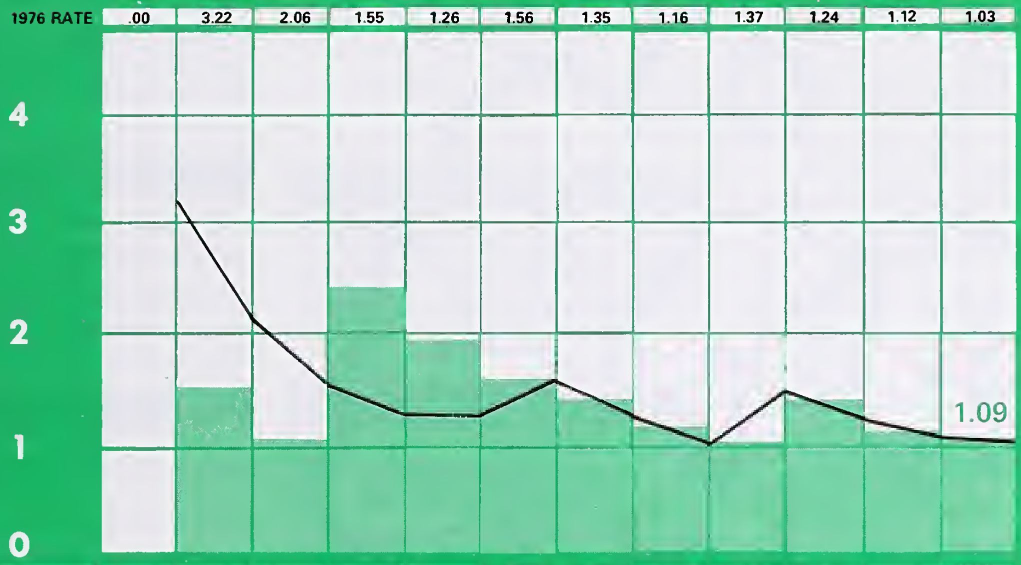
If the weather deteriorates below a 3000 foot ceiling and/or five miles visibility the facility will be returned to service or a NOTAM will be dispatched.

Moral: If you need the services of a particular facility/NAVAID for a training requirement or check ride, review the IFR Enroute Supplement and plan your recovery as thoroughly as you plan the rest of the mission. (From Major Robert J. Scott, Hq SAC Air Traffic Services.)

RADIO/NAV REMARKS- ⓐ For mil acft use only. ⓑ For contract carrier use only. ⓒ N of V16 and E of ONT VORTAC R–360, 5500′ and above. ⓓ 5000′ and below. ⓔ S of V16 and E of ONT VORTAC R–180. ⓕ ONT VORTAC 180°–239°. ⓖ ONT VORTAC 240°–360°. ⓗ No-NOTAM preventive maint sked: TACAN–Wed 2100–2300Z (DT 2000–2200Z); PETTIS NDB–Mon 2000–2030Z (DT 1900–1930Z); ILS–Tue 2000–2400Z (DT 1900–2300Z).

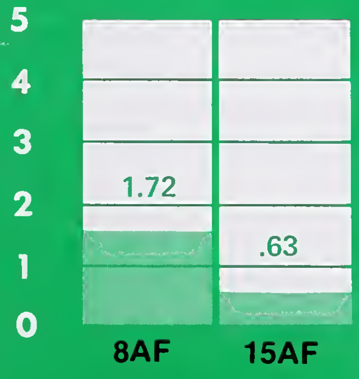
1977 Flying Safety Rate

SAC CLASS A MISHAP RATE (PER 100,000 FLYING HRS)



MISHAPS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1976	0	2	0	0	0	1	0	0	1	0	0	0
1977	0	1	0	2	0	0	0	0	0	1	0	0

1977 SUBORDINATE CMD RATES



LEGEND ⁀ =1976 RATE

MISHAP STATUS

FB-111	FEB 77
B-52	APR 77
KC-135	APR 77
FB-111	OCT 77

45 Seconds . . .

continued from page 10

the runway were failing. The aircraft quickly moved to the left. Wayne had his gloves on by now. He and Hector remained strapped in their seats as the plane left the runway about 2500 feet from the departure end. Bernie braced himself behind the nav's seat and Bill braced himself against the electronics cabinet. They waited. The aircraft was swerving hard to the left and rapidly decelerating. For the next five seconds everyone just held on but their minds were riveted to their escape plan. Deceleration brought the aircraft from 90 knots to zero in five seconds.

15 Seconds — The airplane had turned 180 degrees to the left and came to rest facing downwind 230 feet from the runway. Everyone knew what he had to do. John was feeling the effects of adrenalin as he tried to cut the throttles. He was squeezing the throttles together which made them difficult to move. Steve reached forward over the throttle quadrant and pulled the fire switches. Rick opened the copilot's window and began egress. The area around the plane was well illuminated by burning JP-4 and magnesium fires.

17 Seconds — Rick was fast! He was standing in the window facing away from the airplane. Steve stuffed the rope between Rick's ankles. Rick could easily see the ground about six feet below. With the escape rope dangling between his feet he jumped to the ground and ran. John opened the pilot's window.

The last crewmember was in the window when a gust of wind brought a blast of extremely hot air around the plane . . .

19 Seconds — John threw the rope out the window before he climbed out. There was intense light from the burning magnesium. John used the rope to lower himself and, as he began to run away from the wreckage, he saw Rick already 100 feet or so ahead of him. Bernie and Bill, who were still in the aircraft, stepped to the side and ushered Hector and Wayne toward the front. Bill calmly took last position and waited for everyone to exit before him. He wanted to be absolutely sure everyone got out.

20 Seconds — Steve followed Rick out of the copilot's window. Steve was the only one to use the hand holds above the windows. He lowered himself with the rope using the pilot tube as a step.

23 Seconds — Wayne is the athletic type and when Steve was clear of the jump seat. Wayne quickly exited the pilot's window. Wayne did not follow any recommended procedure. He went head first, literally diving out the window. On his way to the ground, he grabbed the pitot tube in a successful effort to make his feet hit first. The pitot tube was hot and it was fortunate that Wayne had his gloves on. It is certain that Wayne would have sustained burns had Bernie not directed him to put his gloves on.

24 Seconds — While Bill waited in line to exit a window, he tried the crew entry door. It opened only six inches. Hector's turn came. He exited the copilot's window.

27 Seconds — Bill moved behind Bernie who had just exited the copilot's window. Bill didn't know why he waited to use the copilot's window rather than the pilot's window which was clear. Bill noticed that Bernie jumped rather than use the rope. Bill assumed the ground was close.

Outside, John stopped running just as Wayne passed him. John was not yet at a safe distance but he was close enough to see clearly the action at the airplane. John began to count those who had escaped. Rick and Wayne were clear. Steve was running toward him followed by Hector. Bernie had just hit the ground and he was running away from the aircraft.

30 Seconds — The last crewmember was in the window. Bill was facing the airplane and coming down the rope when a gust of wind brought a blast of extremely hot air around the front of the plane. Bill was engulfed in the heat. He closed his eyes, dropped to the ground and laid on his stomach hugging the ground. It was only hot air but the heat was so intense that Bill thought that flames had hit him. He stayed flat on his stomach fearing that it might not be safe to get up.

35 Seconds — Bernie stopped running and turned to see Bill hit the ground and then not move. Bernie thought Bill was hurt and ran back to the burning airplane to help him. By now the burning puddle of fuel was creeping very close to where Bill lay. The heat was intense. Bernie accepted the danger to help a friend.

37 Seconds — As Bernie approached, Bill opened his eyes and saw Bernie standing near him. As Bernie reached for Bill's arm, Bill decided it must be safe to stand. He sprang into action as Bernie helped him up. They raced from the inferno just as the burning JP-4 flowed to where Bill had been.

40 Seconds — As Bill and Bernie raced away, the plane began to explode. Debris fell around the pair as they fled for safety. John breathed a sigh of relief as they put distance between them and the danger.

Actually, it was only a matter of seconds from the time they left the plane until the first explosion . . .

45 Seconds — Everyone was assembled well clear of the wreckage as more explosions ripped it apart. There were several small and three big explosions. John broke from the group to notify the fire department that everyone was safe. Forty-five seconds and they were all safe.

No one had panicked. Everyone stayed cool. Each one had planned his escape as they skidded along the runway. If anyone had difficulty or caused a delay in egress then everyone might not have been safe. It was only a matter of seconds from the time Bernie and Bill left the plane till the first big explosion erupted and flames engulfed the cockpit . . . just seconds!

It was only as they stood watching in the light of the fire that the crewmembers began to feel stress and shock as they realized the gravity of the situation.

There are two points that this crew wants to stress as contributing to their survival. They are protective clothing and egress training. Wayne, especially, realized the importance of wearing gloves during transition training. Each member of the crew recommends that you wear a comfortable jacket for added protection. The new nomex flying jacket, CWU-45/P, offers the best possible protection. Bill Coffin experienced singes and minor burns only on unprotected areas.

This crew also recommends that each crewmember practice egress from every possible escape route. Don't just watch. Do it for yourself. Know how long it takes you to get to safety. You may learn something now that will save your life when seconds count. Take it personally. Encourage fellow crewmembers to practice. Remember, you may be waiting in line while someone else learns the ropes for the first time. You may wait a second too long. This crew was able to stay calm and act swiftly because they knew the egress procedures. Each person knew what he had to do. Each was confident in his own ability because they had recently practiced egress as part of their curriculum at Castle. How long has it been since you've practiced?

You should wear protective clothing and practice egress. Know what you will do if "it" ever happens to you because if it does, you won't have time to learn by trial and error. Forty-five seconds may be a lifetime to you.

ABOUT THE AUTHORS

Captain Roger L. Warnick has over six years of crew experience in the KC-135. Four of those years were spent at Pease AFB and the last two have been spent at Castle as an instructor navigator at CCTS.

Captain Milten W. Price, Jr. has more than seven years experience in the KC-135. He has been stationed at McCoy AFB, Rickenbacker AFB and is currently assigned to Castle AFB as an instructor pilot.

Student Crew 70913 (standing, l-r) Sgt Wayne Isaccson, 2Lt Hector Martinez, 2/Lt Richard Sarver, and Capt Stephen Brummer. Instructor Crew IT-84 (kneeling, l-r) TSgt William Coffin III, Capt Bernard Itzen, and Capt John McKnight.

PROFESSIONAL PERFORMERS

Individuals selected for these pages as SAC's top professional performers of the month are chosen from nominations made by all SAC units. Selection is made only after all nominations have been carefully screened and those chosen meet the highest standards of excellence outlined in SACR 127- 2.

MAINTENANCE MAN. Staff Sergeant Jeffery C. Wintrow, 90th Strategic Missile Wing, F. E. Warren AFB.

MINUTEMAN CREW S-149, 351 SMW, Whiteman AFB: MCCC 1Lt James C. Echols, and DMCCC 1Lt John W. Charbonneau, Jr.

TITAN CREW R-072, 390 SMW, Davis-Monthan AFB: MCCC 1Lt William A. Lyell, DMCCC 2Lt Clifford N. Fisher, BMAT A1C Michael L. Sonnier, BMFT SrA Mark E. Fulton.

BIG INSTRUMENT

continued from page 13

turn exactly on the 15-mile arc with the bearing pointer exactly on the HSI 90 degree index (on the wing tip). If we have under/overshot the turn, we roll out with a correction to the arc. Once on the arc, we turn to place the bearing pointer on the 90 degree index and assume our target bank angle at 5 degrees. If the bearing pointer starts to move off the index, adjust the bank angle slightly to maintain its position. Under no wind conditions, maintaining the bearing pointer on the index will cause the aircraft to track on the 15-mile arc. But what happens when we have a wind?

To correct for any crosswind, displace the bearing pointer above or below the 90 degree index. The computed bank angle is not adjusted. If you are drifting into the station (5 degrees left drift, in our example), place the bearing pointer 5 degrees below the index. Then return to 5 degrees of bank to hold it there. If drift information is not directly available, drift will be detected by noting a change of DME even though the bearing pointer has been maintained on the index. Remember that as you fly an arc, the aircraft heading is constantly changing. Consequently, crosswind component and drift will change throughout the arc. Minor adjustments to the bearing pointer position will allow you to maintain the arc.

The last remaining requirement to insure the success of our arc is to determine a lead point for the turn onto the radial. This means we have to determine the turn radius in miles, the number of degrees per mile on the arc and convert the turn radius to degrees, right? Wrong! The lead point for the radial is two times the computed bank angle. In our case, two times five degrees (ten degrees) is our lead point. Simple, huh?

If you've never flown a constant bank angle arc, give these techniques a try the next time you have the opportunity. You may be surprised at how easily small arcs can be flown.

HALL OF FAME

TACTICAL FLYING

OVER TWENTY-ONE YEARS

170 AREFG, McGuire (NJANG)	NONE

OVER NINETEEN YEARS

171 AREFW, Greater Pittsburgh (PAANG)	Mar '58
157 AREFG, Pease (NHANG)	Jun '58
97 BMW, Blytheville	Aug '58

OVER EIGHTEEN YEARS

940 AREFG, Mather (USAFR)	May '59
307 AREFG, Travis	Sep '59

OVER SEVENTEEN YEARS

19 BMW, Robins	Oct '60

OVER SIXTEEN YEARS

151 AREFG, Salt Lake City (UTANG)	Feb '61
161 AREFG, Sky Harbor (AZANG)	Apr '61
126 AREFW, Chicago O'Hare (ILANG)	Apr '61
134 AREFG, McGhee Tyson (TNANG)	Aug '61

OVER FIFTEEN YEARS

340 AREFG, Altus	Feb '62
301 AREFW, Rickenbacker	Jul '62
96 BMW, Dyess	Aug '62

OVER THIRTEEN YEARS

160 AREFG, Rickenbacker (OHANG)	Dec. '64

OVER TWELVE YEARS

136 AREFW, Dallas NAS (TXANG)	Jun '65
320 BMW, Mather	Jul '65

OVER ELEVEN YEARS

452 AREFW, March (USAFR)	Sep '66

OVER TEN YEARS

92 BMW, Fairchild	Feb '67
55 SRW, Offutt	Jul '67
2 BMW, Barksdale	Aug '67
319 BMW, Grand Forks	Dec '67

OVER NINE YEARS

22 BMW, March	Feb '68

OVER EIGHT YEARS

5 BMW, Minot	Feb '69
42 BMW, Loring	Sep '69
141 AREFW, Fairchild (WAANG)	Oct '69

OVER SEVEN YEARS

28 BMW, Ellsworth	May '70

OVER FIVE YEARS

7 BMW, Carswell	Mar '72
101 AREFW, Bangor (MEANG)	Mar '72
416 BMW, Griffiss	May '72
305 AREFW, Grisson	Aug '72
376 SW, Kadena	Nov '72

OVER FOUR YEARS

379 BMW, Wurtsmith	Apr '73

ICBM

OVER FOURTEEN YEARS

381 SMW, McConnell	Nov '63

OVER THIRTEEN YEARS

90 SMW, F E Warren	Jul '64
1 STRAD, Vandenberg	Sep '64

OVER TWELVE YEARS

308 SMW, Little Rock	Aug '65

OVER SEVEN YEARS

341 SMW, Malmstrom	Apr '70

OVER FOUR YEARS

390 SMW, Davis-Monthan	Jul '73

To gain listing in the Hall of Fame, a SAC or ARF unit must be Class A mishap-free for 48 months.

SAC SAFETY SCREEN

42 BMW, Loring Crew E-10: P Capt Robert Snellenberg, CP Capt Vincent Noto, RN 1Lt Steven Harris, N Capt Stephen Doty, EWO 1Lt Vincent Befi, G SrA Roger Yohe

42 BMW, Loring Crew E-168: P Capt Samuel M Jones, CP 1Lt Mark A Lawler, N 1Lt Raymond A Eberling, BO Sgt Russell D Turley

42 BMW, Loring Crew R-115: P Capt Randall E Johnson, CP Capt Robert B McMillan, N Capt Thomas P Casey, BO Sgt Robert W Moquin

44 SMW, Ellsworth Crew R-011: MCCC Capt Duane A Ayres, DMCCC 2Lt William F Burwell

55 SRW, Offutt AFB: Capt William D Ehmke, Capt Robert J Isbell, TSgt Charles E Gurkin

91 SMW, Minot Crew E-029: MCCC Capt Robert L Demuth, DMCCC 2Lt Dennis F Gillispie

96 BMW, Dyess Crew E-111: P Capt David L Fisser, CP Capt Bryan R Clark, NN 1Lt Robert C Curione, IBO MSgt James R Laborde

319 BMW, Grand Forks Crew R-120: P Capt Francis E Veldman, CP 1Lt Rodney P Johnson, N 1Lt Robert M King, BO A1C Thomas W Schoenike

320 BMW, Mather Crew R-115: P Capt James R Cummings, CP Capt Andrew S Miller, N 1Lt James H Donnell, BO SSgt Timothy G Richardson

321 SMW, Grand Forks Crew E-140: MCCC Capt Kent V Radford, DMCCC 1Lt William S Reed

341 SMW, Malmstrom Crew E-095: MCCC Maj Lawrence A Huggins, DMCCC 1Lt Richard R Minerly

410 BMW, K I Sawyer Crew S-02: P Capt Rodney P Bosserdet, CP Capt John W McWilliams Jr, RN Capt Fred H Guice, N Capt James R Spitler, EWO Capt Charles L Queen, G SSgt Richard L Swain

410 BMW, K I Sawyer Crew E-105: P Capt Robert W Tapaszi Jr, CP 1Lt Larry B Stum, N 1Lt Richard G Fedors, BO MSgt David S McNeill

416 BMW, Griffiss Crew E-17: FP Capt Frederick W Chapman Jr, CP Capt Oscar W Johnston, RN Capt Lawrence R Newcome, NN 1Lt Paul E St Jacques, NE 1Lt Barry J Chisholm, G SMSgt David K Lai

416 BMW, Griffiss Crew E-120: FP Capt Terrance R Pomeroy, CP 1Lt William S Kimmel, CP Capt Frederick S Hoffman, NN Capt Frank A Dietz, IBO TSgt Raymond S Blaich III

509 BMW, Pease Crew S-03: P Capt James Savardo, CP Capt Frank Kelly

509 BMW, Pease Crew S-110: P Capt Steve Anderson, CP Capt Harry Durgin, N Capt Gary Gloede, BO TSgt Joseph Peters

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW SACR 127-2*.

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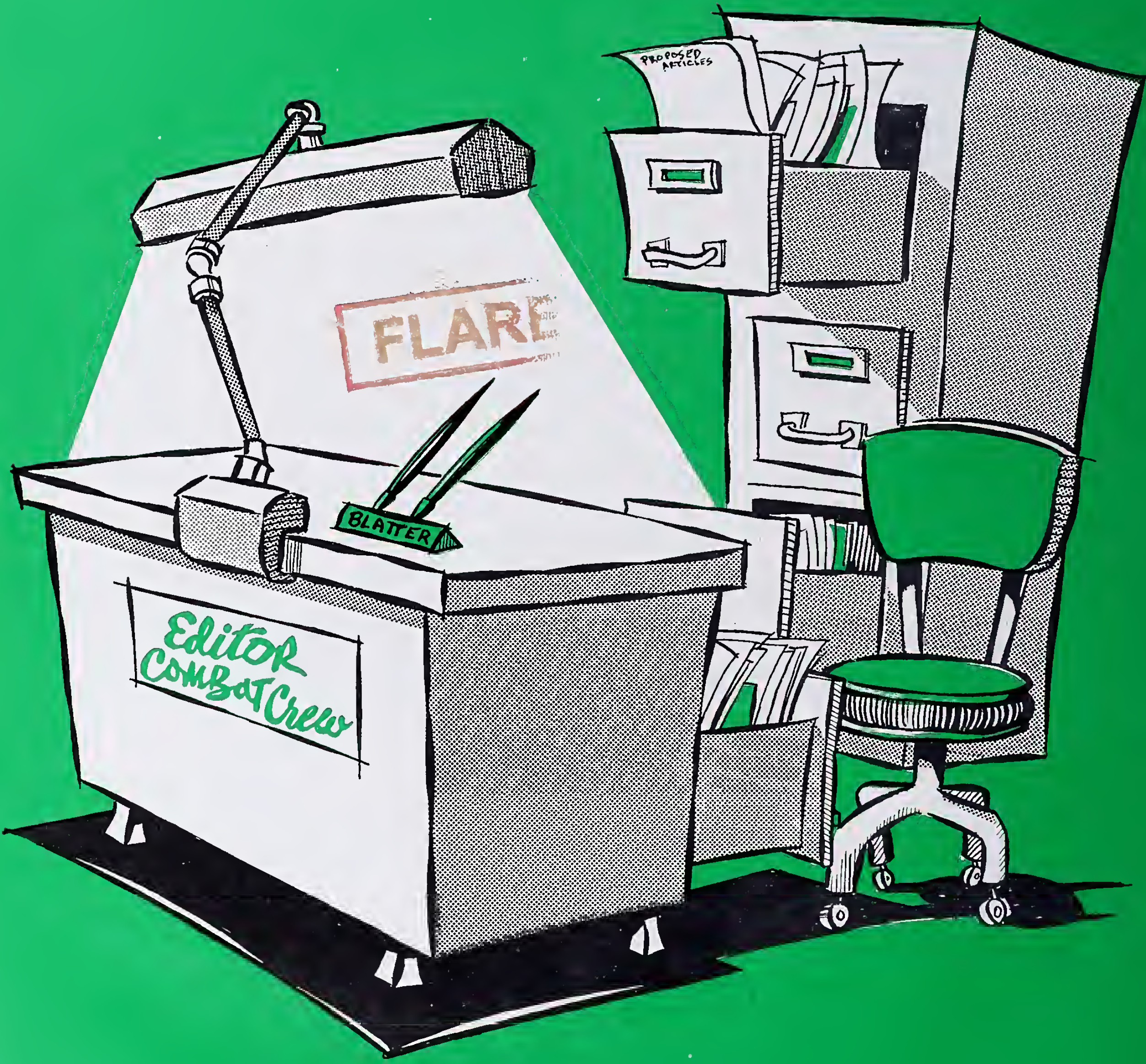
Help Wanted

Combat Crew Editor



The present editor of Combat Crew Magazine will be completing his assignment at HQ SAC in July. The vacancy will be filled this summer. Desired qualifications include: experience as a SAC aircrew member, major or major selectee, diversified Air Force experience (missiles or maintenance), training or experience in journalism, and at least three years on station at the time of reassignment. Applicants should forward a one-page resume to HQ SAC/DOSE, Offutt AFB, NE 68113. Include AUTOVON phone number and any special qualifications that you consider important.